

Draft

Smoky Canyon Mine Remedial Investigation/Feasibility Study

Dinwoody Material Source Investigation Work Plan

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LIST OF ACRONYMS

bgs	below ground surface
BLM	Bureau of Land Management (U.S. Department of the Interior)
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CO	Consent Order
COPCs	chemicals of potential concern
cy	cubic yard
DW	Dinwoody
FS	Feasibility Study
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
mg/L	milligram per liter
MSHA	Mine Safety and Health Administration
NRCS	Natural Resources Conservation Service (U.S. Department of Agriculture)
NTCRA	Non-Time-Critical Removal Action
ODA	overburden disposal area
RI	Remedial Investigation
ROM	run-of-mine
SFSC	South Fork Sage Creek
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service (U.S. Department of Agriculture)

1.0 INTRODUCTION

The J.R. Simplot Company (Simplot) operates the Smoky Canyon Phosphate Mine (“Site” or “Mine”) on National Forest System land in southeastern Idaho (Figure 1-1). The Smoky Canyon Mine is the subject of a 2009 Administrative Settlement Agreement and Order on Consent/Consent Order (Settlement Agreement/CO) entered into by the U.S. Forest Service (USFS), U.S. Environmental Protection Agency (USEPA), Idaho Department of Environmental Quality (IDEQ), and Simplot (USFS, USEPA, and IDEQ 2009). The Settlement Agreement/CO provides a mechanism to conduct a Remedial Investigation (RI) and Feasibility Study (FS). In accordance with the 2009 Settlement Agreement/CO, Simplot has investigated the environmental effects of phosphate mining and milling operations at the Mine and is in the process of identifying remedies to address environmental conditions that represent a risk to human health or the environment.

Environmental conditions at the Site are described in the Final RI Report (Formation 2014), which documents selenium concentrations at Hoopes Spring, South Fork Sage Creek (SFSC) springs, lower SFSC, and lower Sage Creek above the Idaho surface water quality criterion for protection of aquatic life (0.005 milligrams per liter [mg/L] = chronic criterion; Idaho Administrative Procedures Act [IDAPA] 58.01.02.210). Wells Formation groundwater discharging at Hoopes Spring and SFSC springs is the primary source of selenium to surface waters in the lower Sage Creek drainage. The sources of selenium and other chemicals of potential concern (COPCs) to the springs are run-of-mine (ROM) overburden materials removed during active mining to access underlying phosphate ore; the overburden materials are then used to backfill pits or are placed in external overburden disposal areas (ODAs). Water infiltrating through the overburden mobilizes selenium and other COPCs, some which migrates into the Wells Formation aquifer. The primary remedial actions being evaluated in the FS are ODA covers and water treatment (Formation 2017).

1.1 Background

A 2016 technical memorandum entitled “CERCLA Cover Material Source Evaluation” (Formation 2016) presented an evaluation of potential material sources for ODA cover systems at the Site for consideration in the FS process under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). A listing of multiple potential material sources was presented for Dinwoody Formation material (referred to as “Dinwoody”) and a combination of Rex Chert and limestone gravel (referred to as “Rex Chert/limestone”). For each potential material source, information was presented including land ownership or lease status, estimated area, estimated recoverable volume, potential slope issues, and assumed haul destination and distance. As documented in the technical memorandum (Formation 2016),

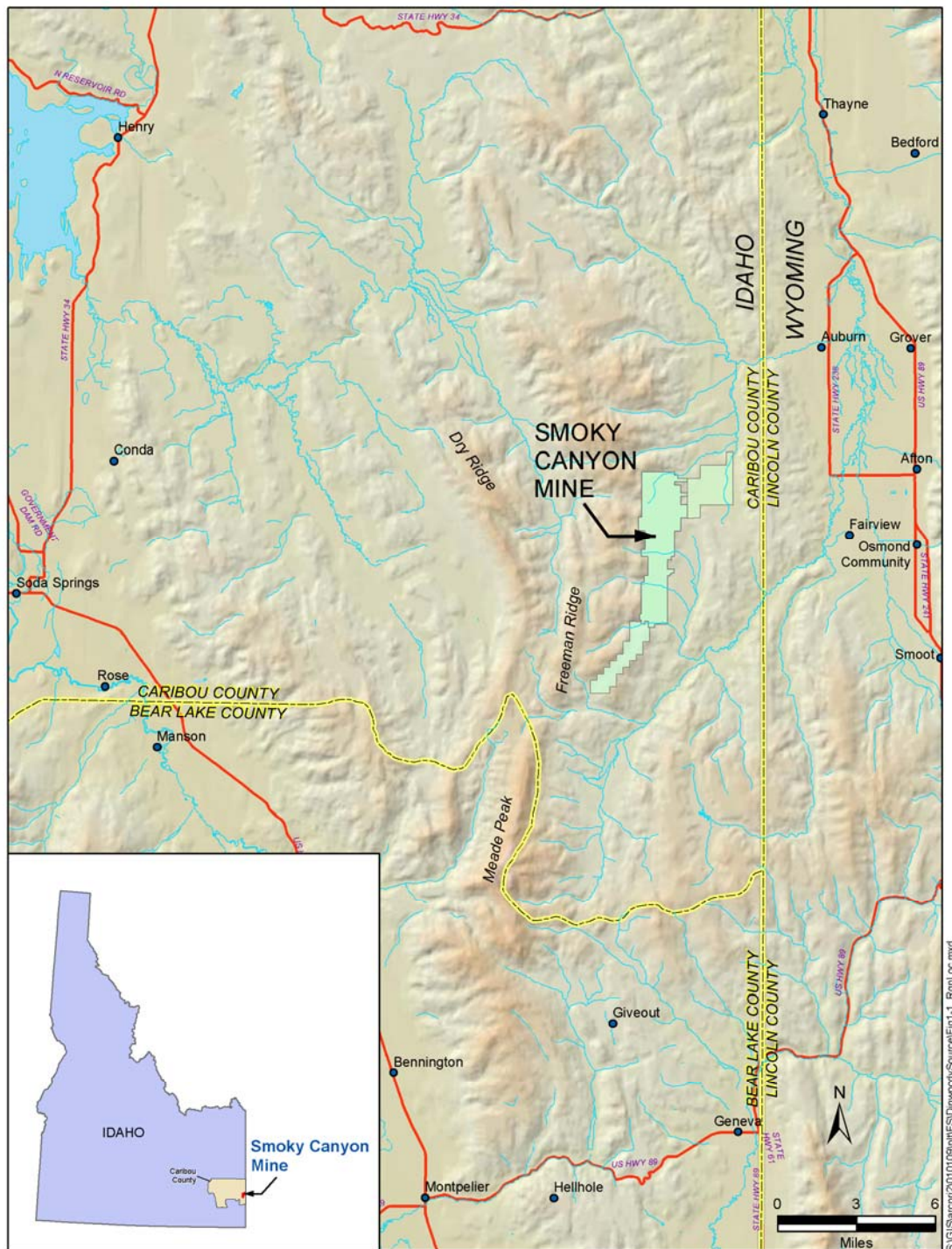


Figure 1-1: Site Location

many of the potential material sources were eliminated due to issues related to slope steepness, slope stability, accessibility, or previous commitment for other Mine-related uses. Cost estimates for accessing, excavating, and hauling materials from the remaining sources to areas potentially requiring CERCLA cover systems were prepared (Formation 2016). The retained material sources are summarized below.

Rex Chert/limestone will be obtained over the next several years during mining in Panel B (Figure 1-2) as it is excavated to access the ore body (Formation 2016), and will be stockpiled in an area south of the mined pit. Because the characteristics of Rex Chert/limestone are well known and sampling of Rex Chert/limestone is included in ongoing mining operations, additional testing of these materials and further characterization is not currently planned (Formation 2016). However, the FS will evaluate the extent and available volume of Panel B Rex Chert/limestone in coordination with the timing and backfill requirements of mining in this area along with agency concurrence with the proposal to stockpile Rex Chert/limestone. Additional assessment of potentially limiting conditions, hauling logistics, and other considerations will also occur as part of the detailed analysis in the FS. Coordination of potential CERCLA cover system material needs and Rex Chert/limestone made available during Panel B mining will be required so that an appropriate volume is stockpiled.

The Dinwoody material sources retained for site-specific characterization and further consideration (Formation 2016) are (Figure 1-2):

- B-Panel Dinwoody (DW) Borrow A and B (located northeast of B-Panel)
- West Smoky DW Borrow C (located west of A-Panel)
- D-Panel DW Borrow A and B (located west of D-Panel)
- E-Panel DW Borrow A and B (located west of E-Panel)

Review of information from previous investigations of Dinwoody sources indicates the maximum estimated recoverable Dinwoody volume from these borrow sources is 7.4 million cubic yards (cy) (Formation 2016). Although the volume of cover material that could be needed for a CERCLA remedy has not been specified, pending evaluations conducted under the FS, preliminary estimates indicate the total material volume needed may be 3.6 million cy, assuming a total surface area of approximately 750 acres (maximum) and a 3-foot-thick Dinwoody layer.

Further testing of Dinwoody material is not required at this time due to the amount of sampling and testing that has already occurred, and given the fact that this material has already been used successfully on-site. However, site-specific information is needed at this early stage of the FS to improve the estimates of available volume for the four source areas (Formation 2016). Therefore, Simplot plans to advance borings and/or excavate test pits in the proposed Dinwoody source areas, as described in this Work Plan. To the extent possible, information on the borrow area materials will be reviewed relative to guidance for evaluating soils for

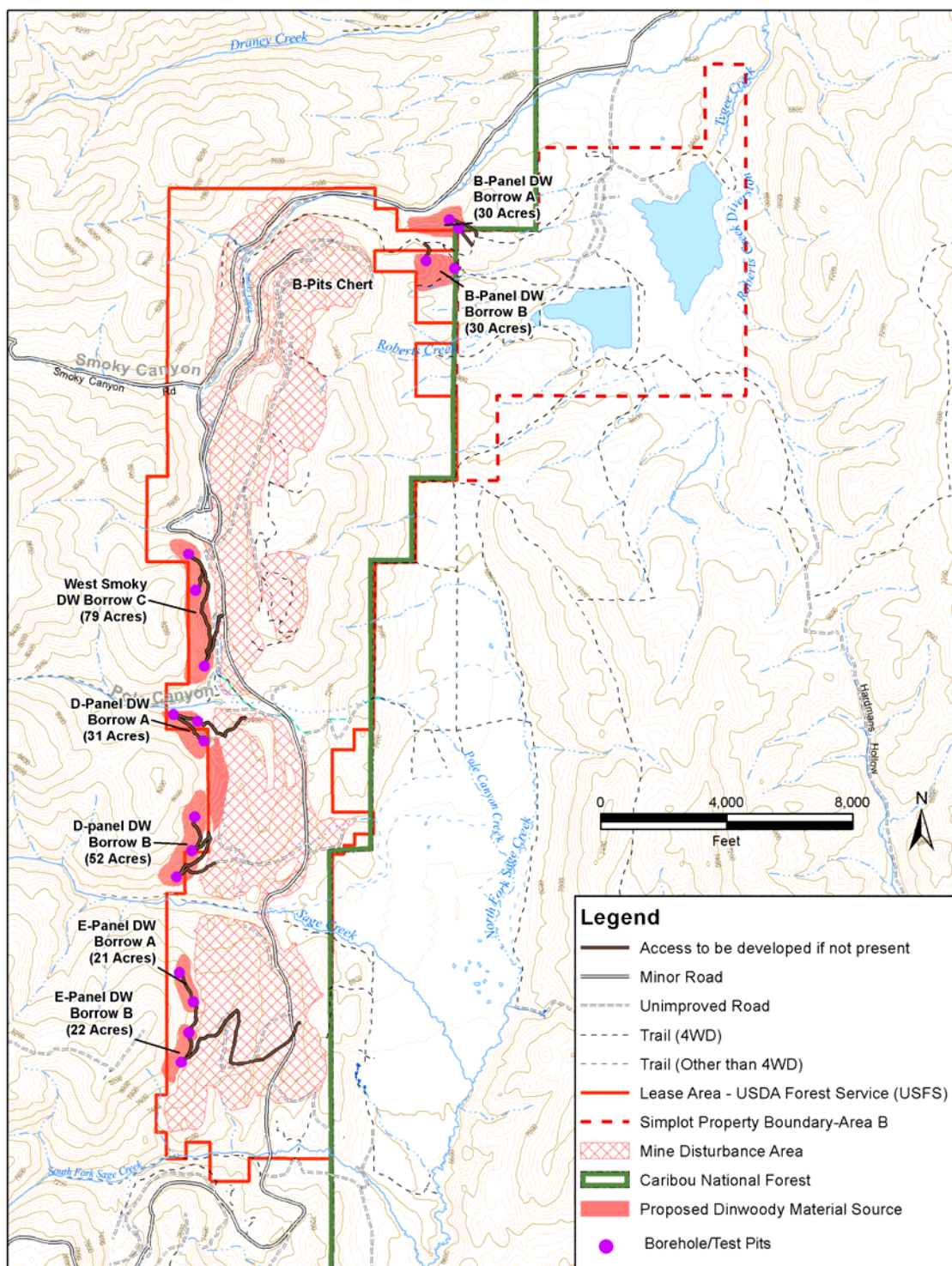


Figure 1-2: Investigation Area and Boring/Test Pit Locations

reclamation as provided by the Natural Resources Conservation Service (NRCS) (2013a, 2013b) via the USFS (2013, 2014). The findings of the investigation will be used to develop a matrix of available material source areas to support the identification and evaluation of remedial alternatives in the FS.

1.2 Types of Dinwoody Material

The Dinwoody Formation covers a large area that extends throughout the Smoky Canyon Mine. Although there is some variability in the composition and properties of Dinwoody material in the area, it is generally comprised of interbedded siltstone, shale, and limestone that grade into a calcareous shale and siltstone with depth. Typically, Dinwoody is a well-graded, fine-textured material with a low saturated hydraulic conductivity and a high moisture storage capacity.

Simplot logged cuttings and identified zones within the Dinwoody unit during an investigation of the Dinwoody borrow area developed and utilized for construction of the Pole Canyon ODA cover system in 2015, under the 2013 Non-Time-Critical Removal Action (NTCRA) (Formation 2013). Similar characterization of the Dinwoody unit was also conducted earlier during drilling programs at Panel F. The Dinwoody has been characterized as “Type A” (highly weathered Dinwoody) and “Type B” (weathered Dinwoody) with the more highly weathered Type A material overlying the less weathered Type B. Type A material is a higher quality cover material than Type B. However, Type B material has been observed to weather quickly once exposed, also making it suitable for use as a cover material. The Type A material follows the surface topography, whereas, the overall Dinwoody geologic unit follows the general dip of the Meade Peak Formation in the region. The drilling program in Panel F confirmed that the highly weathered portion of the Dinwoody unit (Type A material) is approximately 40 feet thick and that it follows the surface topography.

Figure 1-3 and Figure 1-4 show the visual delineation method used to identify different types of Dinwoody cover material in Panel F. It can be seen that the Type A material (also labeled as “priority Dinwoody” in the figures) follows the surface topography in this area.

1.3 Objective

The objective of this investigation is to provide site-specific information needed for the detailed analysis of remedial alternatives in the FS by locating, delineating, and estimating available volumes of Dinwoody material for potential future use. The Dinwoody sources identified and retained in the technical memorandum (Formation 2016) will be investigated, and the data collected in this investigation will be used to update the Site block model to further refine initial Dinwoody material volume estimates.

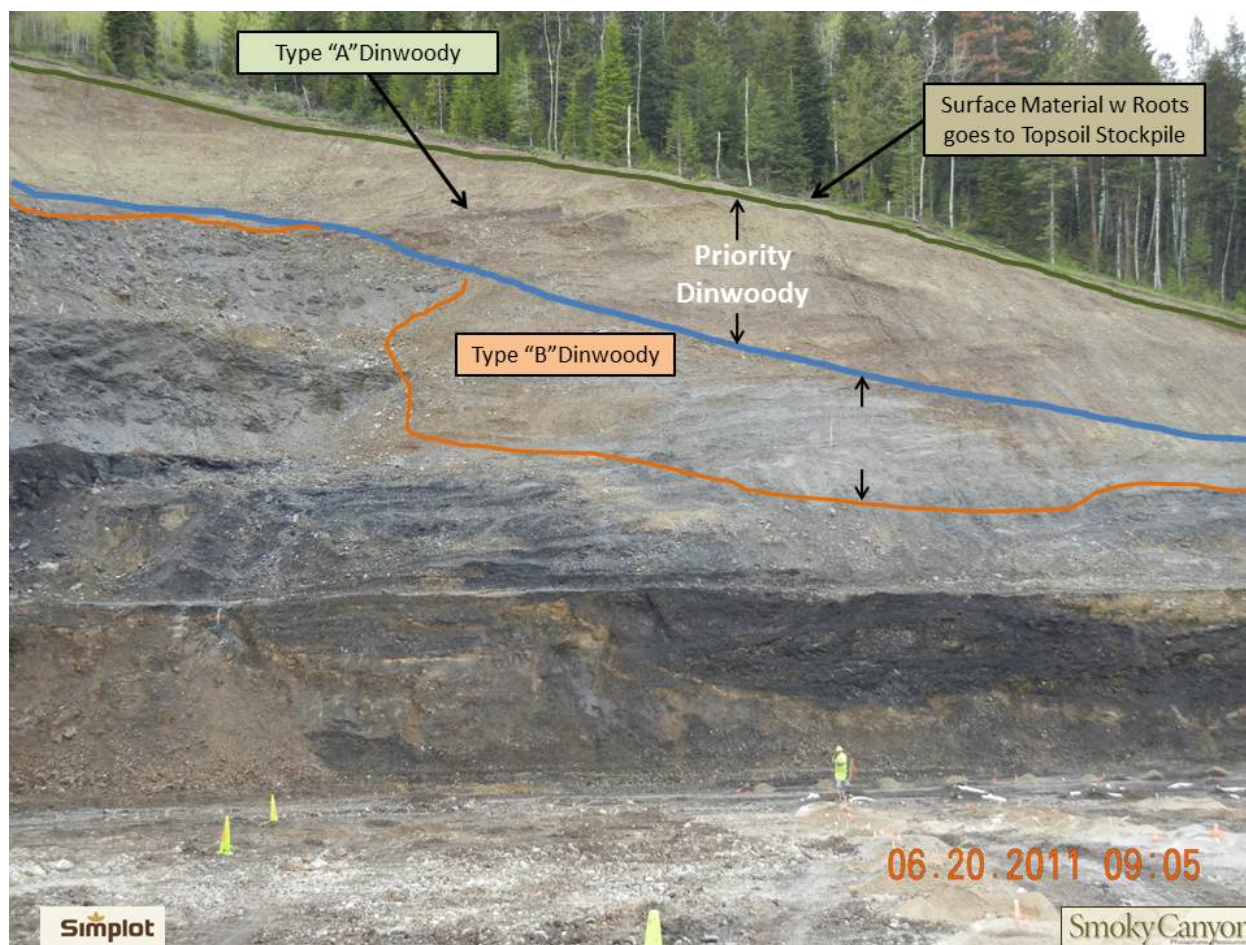


Figure 1-3: Visual Delineation of Dinwoody Material in Panel F – Example 1

Borings will be advanced and/or test pits will be excavated in each investigation area to obtain profile data and to distinguish between Type A and Type B Dinwoody material. Volume estimates will be calculated by multiplying the thicknesses of the Dinwoody material types by the approximate area represented by each boring and/or test pit. The volume estimates are needed to determine the availability of Type A and Type B Dinwoody material. Type A material is preferred over Type B and, if sufficient volume is available, only Type A material would be used for CERCLA covers. However, Type A material can be supplemented with Type B material if needed.

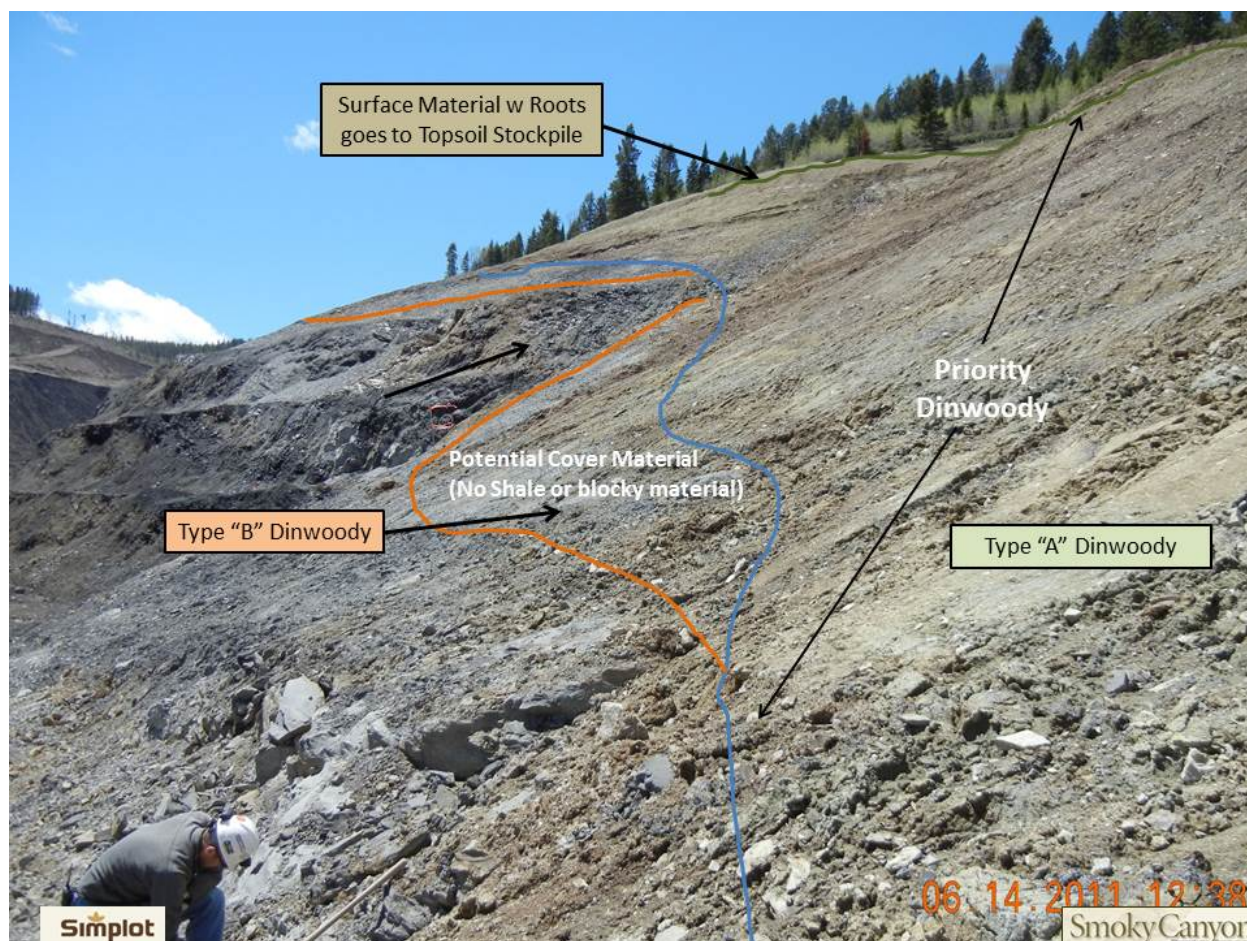


Figure 1-4: Visual Delineation of Dinwoody Material in Panel F – Example 2

1.4 Work Plan Organization

This document is comprised of five sections, organized as follows:

- **Section 1.0 – Introduction:** general description of the purpose of the investigation and background.
- **Section 2.0 – Investigation Plan:** description of the activities proposed under the plan.
- **Section 3.0 – Roles and Responsibilities:** summarizes the roles and responsibilities.
- **Section 4.0 – Reporting:** describes the evaluation and reporting of the investigation findings.
- **Section 5.0 – References:** listing of the referenced documentation.

2.0 INVESTIGATION PLAN

The investigation will consist of identifying, delineating, and estimating volumes of Dinwoody material sources. The process for borrow area development will be addressed after completion of the investigation covered by this Work Plan and final selection of Dinwoody borrow material areas.

A cultural resources survey was conducted by Sagebrush Consultants (2013) prior to investigation of the borrow area west of Panel D that was used for the Pole Canyon NTCRA cover system (constructed in 2015) (Formation 2013). Simplot will coordinate with the USFS if a similar cultural resources survey is required for the borrow areas to be investigated under this Work Plan.

2.1 Boring and/or Test Pit Development

The investigation areas and boring/test pit locations are shown in Figure 1-2. The number and locations of the borings/test pits have been selected based on the physical/geologic setting of, and access to, each investigation area (Table 2-1). Access by the drilling or test pit excavation equipment will require removal of selected trees and will result in localized areas of flattened herbaceous and small woody vegetation. Simplot will plan to conduct the clearing needed to access the investigation locations outside of the May 15 through August 15 nesting season. However, if it becomes necessary to implement ground clearing during the nesting season, Simplot will seek an exception from the USFS and comply with the USFS requirements if the exception is granted.

Findings from previous Dinwoody observations at the Mine indicate that the maximum target exploration depth will be approximately 35 to 50 feet below ground surface (bgs). Exploratory borings will be advanced to this depth range using a wheel-mounted air rotary drilling rig. Test pits will be excavated using a backhoe, trackhoe, or similar equipment to depths generally no greater than 15 to 25 feet bgs.

Table 2-1: Summary of Number of Borings/Test Pits for Dinwoody Borrow Area Investigation Activities, and Disturbance Areas on USFS Lands

Location	No. of Borings or Test Pits	Lease No.	On-Lease				On Existing USFS Use Permit		On USFS Land (Off-Lease)		Total Area (ac)
			New Disturbance		Reclaim/Mine Disturbance Area						
			Road Length (ft)	Area (ac)	Road Length (ft)	Area (ac)	Road Length (ft)	Area (ac)	Road Length (ft)	Area (ac)	
Dinwoody Borrow Areas on USFS Lands											
West Smoky C	3	012890	2,310	1.06	0	0	4,330	1.99	0	0	3.05
D-Panel A	3	012890	791	0.36	935	0.43	2,163	0.99	621	0.29	2.07
D-Panel B	3	012890	819	0.38	0	0	1,773	0.81	3,148	1.45	2.64
E-Panel A	2	030369	2,075	0.95	0	0	0	0	0	0	0.95
E-Panel B	2	030369	2,450	1.12	5,757	2.64	0	0	0	0	3.77
B-Panel A	2	off-lease	0	0	0	0	0	0	960	0.44	0.44
B-Panel B	2	off-lease	0	0	0	0	0	0	290	0.13	0.13
Total:	17	Total:	8,445	3.87	6,692	3.07	8,266	3.79	5,019	2.31	13.1

Notes:

1. Disturbance areas calculated are only for roads and drilling pads associated with the investigation where occurring within USFS on-lease, Use Permit, off-lease lands.
2. All access road disturbances were calculated with a 20-ft disturbance width.

2.2 Data Collection and Completing Investigation Locations

The depth of each material, including Type A and Type B Dinwoody material, will be determined by visual delineation and inspection of drill cuttings for borings and excavated material or the exposed soil profile for test pits. This information, along with land-surface elevation data, will be used to generate volume estimates of the types of Dinwoody material present at the proposed borrow source areas.

The borings or test pits will be logged by an on-site geologist or mine engineer that has experience identifying the Dinwoody material types at the Mine. Boring samples will consist of drill cuttings that are ejected from the borehole by air pressure. Differences between Type A, Type B, and unsuitable Dinwoody material will be indicated by changes in color, clay content, field durability testing, and drill rig (or test pit excavation equipment) behavior. Photos will be taken during the investigation to document the drilling and/or excavation activities. To the extent possible, information on the borrow area materials will be reviewed relative to guidance for

evaluating soils for reclamation as provided by the NRCS (2013a, 2013b) via the USFS (2013, 2014).

Upon completion of data collection, each borehole or test pit will be backfilled with drill cuttings or excavated material to the land surface. This is viewed as an acceptable practice in this instance because:

- 1) These are simple geotechnical boreholes or test pits as opposed to groundwater monitoring wells,
- 2) There is no potentially seleniferous overburden in the borrow areas,
- 3) The borings/test pits will not intercept regionally important groundwater aquifers such as that in the Wells Formation, and
- 4) The area in which the boreholes/test pits are completed will likely be excavated in the near future as part of borrow area development.

Areas disturbed for the investigation will be reclaimed by completing minor earthwork/grading, as needed, and revegetation to stabilize the disturbed areas. Access routes (other than permanent or existing routes), drill pads, and test pits will be restored to pre-existing contours, abating any erosion concerns. Re-contoured areas will be broadcast seeded with the reclamation seed mix used at the Mine.

3.0 ROLES AND RESPONSIBILITIES

The primary Simplot contact for this investigation is Jeffrey Hamilton. Simplot is responsible for:

- Implementation of the investigation;
- Communication and coordination with the agencies;
- Selecting a qualified driller to drill the borings or operator to excavate the test pits; and
- Providing an on-site geologist or mine engineer for the field data collection.

Formation Environmental is the CERCLA consultant/contractor to Simplot and is responsible for integrating the investigation results into the next steps under the FS.

The USFS and supporting agencies will perform agency oversight as needed for implementation of the investigation.

All personnel on Site must have completed Mine Safety and Health Administration (MSHA) training, and shall be in compliance with Smoky Canyon Mine specific health and safety plans as applicable.

4.0 REPORTING

Simplot will produce a Dinwoody Borrow Material Source Investigation Summary that will present the findings of the investigation, boring/test pit logs, photo logs, volume calculations, and recommendations for development of the identified Dinwoody material borrow sources.

The following schedule is anticipated for the completion of the Dinwoody borrow material source investigation:

- Agency preliminary approval of this Work Plan – end of May 2017.
- Agency final approval of this Work Plan – middle of July 2017.
- Initiation of field work – middle of August 2017.
- Completion of field work – end of September 2017.
- Submittal of the draft Dinwoody Borrow Material Source Investigation Summary – 90 days after the completion of field work.

5.0 REFERENCES

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